# CENTERS FOR DISEASE CONTROL AND PREVENTION

# AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

# POLLUTION PREVENTION PLAN

**SEPTEMBER 1996**

CDC/ATSDR Environmental Quality Council

CDC & ATSDR Healthy People in a Healthy World, Through Prevention

# INTRODUCTION

## Executive Order 12856

Executive Order 12856 (August 3, 1993) requires federal facilities, which were previously exempt, to comply with both the Emergency Planning and Community Right-to-Know Act of 1986 ("EPCRA") (42 U.S.C. 11001-11050) and the Pollution Prevention Act of 1990 (" PPA")(42 U.S.C. 13101-13109). In addition E.O. 12856 sets specific pollution prevention goals and directives for covered facilities. Federal agencies must adopt pollution prevention goals, including a 50% reduction goal for releases of toxic chemicals and/or pollutants by 1999, develop a pollution prevention strategy, and covered facilities must draft a pollution prevention plan by December 31, 1995. The plan should set goals, identify activities, and establish a time line to reduce and eliminate the acquisition, manufacture, processing, or use of toxic chemicals and extremely hazardous substances at the facility. In addition, the plan should include any other activities that may adversely impact the environment, considering all environmental media, and identifying specific activities that will reduce such impacts to the media. Additional related requirements are found in other Executive Orders. These are set out in EPA: Federal Facility Pollution Prevention Planning Guide (EPA-300-B-94-013) and are discussed in this plan.

Pursuant to the Executive Order, the Department of Health and Human Services ("HHS") has issued a Pollution Prevention Strategy (attached) which sets out the Departments' Pollution Prevention Policy Statement and related items. Pollution prevention is defined therein to mean " source reduction," as defined in the PPA, and other practices that reduce or eliminate the creation of pollutants through:

- ♦ increased efficiency in the use of raw materials, energy, water, or other resources; or
- ♦ protection of natural resources by conservation.

Source Reduction is defined in the PPA to mean any practice that:

- ♦ reduces the amount of any hazardous substance, pollutant or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment or disposal; and
- ♦ reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.

The term includes equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control.
The HHS strategy designates the Centers for Disease Control and Prevention ("CDC") as a " covered facility" as defined in EPCRA[1]. While the Agency for Toxic Substances and Disease

Registry ("ATSDR") is not designated as a covered facility, applicable pollution prevention strategies and activities, such as for solid waste and consumption of resources, will be applied to ATSDR functions.

**The Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry**

The CDC is an agency of the HHS with about 6000 employees and over 17 locations throughout the United States and the World. CDC serves as the national focus for developing and applying disease prevention and control, environmental health, and health promotion and health education activities designed to improve the health of the people of the United States. To accomplish this, CDC identifies and defines preventable health problems; maintains active surveillance of diseases through epidemiologic and laboratory investigation, data collection, analysis and distribution; serves as the Public Health Service's lead agency in developing and implementing operational programs relating to environmental health problems and conducts operation research aimed at developing and testing effective disease prevention.

In support of its mission, CDC maintains biomedical research functions in the Atlanta area, and other locations, with approximately 500 laboratories. These laboratories utilize various chemicals and other substances which can result in chemical waste including acids, bases, flammable solvents, radioisotopes, poisons, oxidizers, and others. Additional sources of potential releases from the CDC facilities are emissions from boilers and back up electrical generators, solid pathological waste incinerators, glass and cage washing facilities, and the generation of solid waste through routine operations.

The ATSDR, also an agency of HHS, implements the health related authorities of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA" or " Superfund")(42 U.S.C. 9601 et sec.), and has research, information, and consultation responsibilities under other environmental statutes. The ATSDR maintains it headquarters facility in Atlanta, with regional staff in the ten EPA regions. ATSDR's facilities are primarily office environments.

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[1] A "facility" is defined as: all buildings, equipment, structures, and other stationary items which are located on a single site or on contiguous or adjacent sites and which are owned or operated by the same person (or by any person which controls, is controlled by, or under common control with, such person). For purposes of [emergency release notification], the term includes motor vehicles, rolling stock, and aircraft.

It also includes; "manmade structures in which chemicals are purposefully placed or removed through human means such that it functions as a containment structure for human use."

A facility further becomes "covered" if it meets the threshold requirements for EPCRA compliance.

## CDC Environmental Management Program

Primary responsibility for CDC[2] environmental management resides with the Office of Health and Safety (OHS). The mission of OHS is to provide leadership to promote and assist in the achievement of safe and healthful working conditions for CDC employees, contractors, and visitors, and to support and cultivate the principles of pollution prevention and environmental stewardship. The Environmental Management Program, within OHS, is responsible for the day to day oversight of environmental compliance for hazardous waste disposal, environmental permits, underground storage tank management, environmental quality, and more.

In addition, an Environmental Quality Council ("EQC") was created by the CDC Director in 1993. The council comprises members from most of the Centers, Institutes, and Offices (CIO's), and reports to the Director's Senior Staff. The mission of the EQC is to advise, assess, and implement environmental programs and strategies for all CDC/ATSDR organizational units and locations. The EQC has assumed responsibility to initiate a Pollution Prevention Plan and program for CDC, and to assist OHS in implementing pollution prevention strategies and activities.

## CDC Planning Process

The HHS Strategy, consistent with E.O. 12856 requires that each covered facility prepare a Pollution Prevention Plan to include at a minimum:

- Top Management Support
- Program Organization
- Pollution Prevention Goals
- Pollution Prevention Awareness Programs
- Accurate Waste Accounting
- Accurate Cost Accounting and Appropriate Cost Allocation
- Periodic Pollution Prevention Opportunity Assessments
- Information Exchange and Technology Transfer
- Program Implementation and Evaluation.

This plan represents CDC's goals and general strategies for meeting the requirements of the Executive Order and the elements set out in the HHS statement. The CDC planning process follows the seven steps set out in the EPA publication "Federal Facility Pollution Prevention Planning Guide." The CDC considers this to be an iterative process, subject to change as data is gathered and analyzed, opportunity assessments are conducted, and strategies are tested. As part of the planning process, the EQC continues to assist the Environmental Program Manager to help

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[2] References to CDC herein include ATSDR

define pollution planning goals and procedures, and identify data needs, activities, and opportunity assessments.

# POLLUTION PREVENTION PLAN

## Step One: Develop Pollution Prevention Goals

The Executive Order states that "The head of each Federal agency subject to this order shall ensure that the agency develops voluntary goals to reduce the agency's total releases of toxic chemicals to the environment and offsite transfers of such toxic chemicals for treatment and disposal from facilities covered by this order by 50% by December 31, 1999. To the maximum extent practicable, such reductions shall be achieved by implementation of source reduction practices." (Section 3-302(a)). In addition, each agency should also adopt additional goals which promote the principles of pollution prevention for other sources and types of pollution.

The CDC has adopted the suggested goal to;

> reduce total releases of **toxic chemicals** to the environment and off-site transfers of such toxic chemicals for treatment and disposal by 50% by December 1999. To the maximum extent practicable such reductions shall be achieved by implementation of source reduction practices.

In addition, the CDC is committed to;

> reduce total releases and off-site transfers of **toxic pollutants** to the maximum extent practicable.

CDC has also adopted the following goals as part of a comprehensive pollution prevention program:

- reduce unnecessary purchases of toxic and hazardous chemicals;
- procure recycled content materials (E.O. 12873 - Federal Acquisition, Recycling, and Waste Prevention (October 20, 1993));
- increase recycling volume (E.O. 12873);
- reduce solid waste (E.O. 12873);
- reduce resource consumption (E.O. 12902 - Energy Efficiency and Water Conservation (March 8, 1994);
- reduce releases to environmental justice areas (E.O. 12898 - Federal Actions to Address Environmental Justice);
- reduce pesticide usage;
- implement a pollution prevention awareness program.

As indicated, many of the preceding optional goals are covered by Executive Orders other than 12856. As such, activities may have already been initiated through other channels within the

Government and the Department. Prior to pursuing these goals, appropriate inquiries will be made to determine the extent that activities are underway, to avoid duplication and inefficient use of resources.

Goals may be added and/or deleted as deemed necessary. In addition, these goals will be more specifically defined and quantified after analysis of appropriate baseline information. Ultimately, each goal to be pursued must incorporate a quantified measure of success, and a time line for achievement.

While not set out as a specific goal, a key element in achieving pollution prevention goals is the implementation of accurate waste and cost accounting systems. Such systems provide a mechanism to track the input, use, disposal, and overall costs of materials used by the facility. This concept is addressed in the HHS Pollution Prevention Strategy, and will be incorporated in to the CDC program.

**Step Two: Obtain Management Commitment**

In order to have a successful pollution prevention program, there must be commitment and approval from upper management. This enables the program to obtain resources needed to initiate the program. The team developing this plan must have the authority to develop, implement, and facilitate a facility-wide pollution prevention program due to its far reaching implications. The successful waste prevention and reduction programs often are those that are encouraged and supported at the highest management levels. Conceptual management commitment to environmental quality and pollution prevention at CDC has been obtained. CDC management chartered the Environmental Quality Council in 1993, which has conducted the activities described above. The current CDC director has issued an Environmental Policy Statement which states full support for the policy of environmental quality, and asks each member of the CDC to commit to pollution prevention in their daily work routines. Finally, as stated above, the Department of Health and Human Services has developed a Department strategy for Pollution Prevention.

CDC senior management commitment to this Pollution Prevention Plan will be sought through the solicitation of input from potentially impacted middle management, and a presentation of the completed plan to the senior executive staff. In addition, appropriate upper and middle management will be involved in subsequent assessment and implementation activities.

**Step Three: Establish a Pollution Prevention Team**

A key to a successful pollution prevention program is the staff which works to create it. The planning team is from a broad spectrum of facility personnel.

The Environmental Quality Council has assumed responsibility, with the OHS, to initiate the planning process, and draft the pollution prevention plan using a team approach. A subcommittee was established to draft the plan with extensive input from EQC membership. Wider agency input will be pursued to implement the plan.

The EQC will serve as a lead team to define priorities, and initiate the establishment of appropriate teams to assess baseline information, identify pollution prevention activities, and conduct opportunity assessments. Such teams must include relevant, knowledgeable staff in the various areas targeted for pollution prevention. The EQC will continually assist and facilitate such teams. The EQC will also serve in the lead team capacity for the creation of implementation teams for activities and strategies. However, the Office of Health and Safety, in conjunction with the appropriate organizational unit, will be responsible for implementation of the Pollution Prevention Program.

A model for this team approach is the *CHEMMAN* project, which was initiated independent of this planning process. The purpose of this project is to develop an effective, efficient process for chemical materials management, including, ordering, receiving, recording, tracking, storing, disposing and paying for chemical materials and lab supplies. These efforts will contribute significantly to the goals of chemical pollution prevention, and are being integrated into this planning process. The *CHEMMAN* team consists of two groups which are the Implementation Team and Management Assessment Team. They include the following members:

Implementation Team

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| Ed Snow, Chair | National Center for Infectious Diseases |
| Bill Slazyk | National Center for Environmental Health |
| Don Holderman | National Institute for Occupational Safety and Health |
| Tammy Gorny | Office of Health and Safety |
| Robert Hill | Office of Health and Safety |
| Chris Doss | Engineering Services Office |
| Belinda Corley | Financial Management Office |
| Judy Kenny | Information Resources Management Office |
| Danny Hager | Procurement and Grants Office |

Management Assessment Team

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| Deborah L. Jones, Chair | Office of Program Support |
| Tony Daniels | Financial Management Office |
| Dr. Bill Martin | National Center for Infectious Diseases |
| Mel Myers | National Institute for Occupational Safety and Health |
| Dr. Jonathan Richmond | Office of Health and Safety |
| Carolyn Russell | Management Analysis and Services Office |
| Dr. Eric Sampson | National Center for Environmental Health |
| Jim Seligman | Information Resources Management Office |
| George Steube | Engineering Services Office |
| John Williams | Procurement and Grants Office |
| Lander Stoddard | National Center for Infectious Disease |

The Management Assessment Team reports to the CDC Deputy Director, and has high-level management support.

Due to the massive scale of the problem addressed by *CHEMMAN*, that team has chosen to use Business Process Reengineering. Other teams may also use this method for areas where an entire system is considered to have broken down and needs to be rebuilt. Most however, will use the tools of Total Quality Management, which provides a means to fix aspects of a basically sound system. Appropriate training in these methods, and experienced facilitators should be provided to the teams as needed.

**Step Four: Develop a Baseline**

In order to develop a comprehensive Pollution Prevention Program for this facility, extensive baseline information must be generated and examined. This activity should create an overall picture of the facilities hazardous and nonhazardous materials usage, and the ultimate environmental impacts of these patterns. This process is just beginning at CDC. Listed below are specific activities that are planned or ongoing. In addition, the EQC has identified potential sources of baseline data that must be gathered and analyzed by appropriate personnel.

**Chemicals**:

A chemical baseline is specifically required to measure the reductions in releases of toxic chemicals to the environment and off-site transfers of such chemicals for treatment and disposal in order to reach the 50% reduction goal. The chemical baseline amount was required to be generated no later than the 1994 reporting year. CDC is currently developing chemical baseline data that will also help to determine if EPCRA reporting is required.

A baseline for chemicals currently on-site at the CDC is being performed by a contractor who will take a chemical inventory of approximately 500 CDC laboratories. Chemical inventory data will be entered into the LINDEN™ computer system.[3] LINDEN™ is an environmental management system for chemical inventory control, regulatory compliance and reporting, material safety data sheet (MSDS) management, and waste management and minimization. In order to optimize the use and effectiveness of this system, an ongoing bar coding process must be established for all incoming chemicals. The bar code system will be used to track the inventory and disposal of all chemicals, and also may allow for the development of an integrated hazardous materials and waste management system.

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[3]MTC developed the Linden™ system through a Cooperative Research and Development Agreement (CRADA). The CRADA has a "Government Purpose License" or "GLP" which conveys a nonexclusive, irrevocable, worldwide, royalty-free license to all government agencies. One of the primary goals of the system is to provide a means of tracking inventory and waste that meet regulatory reporting requirements. Other systems are cost prohibitive and do not adequately address the underlying regulatory requirements. Other systems were identified and evaluated for further consideration. These systems were eliminated due to cost/licensing constraints, missing functionality, and the ability to customize the application to meet our requirements.

Additional information may be derived from hazardous chemical waste disposal records. These are records maintained in the hazardous waste disposal activity for CDC which contains data on chemical hazardous waste volume, type, and ultimate disposal method and location. Current state and local air and water permits may provide baseline information on additional chemical or toxic emissions.

Records related to pesticide usage are available from direct purchases and contractor records.

The CDC has also developed and implemented a comprehensive environmental audit program that combines periodic external audits and internal self audit cycles. The findings generated by this process are an additional source of baseline information.

**Nonchemical releases and related efforts**

The development of nonchemical baseline information will be conducted by functional teams composed of relevant personnel. A preliminary list of sources of information was generated at the EQC retreat. These include;

- solid waste disposal records - type and volume of wastes, disposal method and location
- recycling volumes - type and volume of materials recycled
- procurement of recycled materials - type and volume of materials purchased and percentage of recycled content including paper, cardboard, toner cartridges, plastic, and aluminum,
- resource consumption - amounts of electricity, water, gas/oil consumed by facility

Pollution prevention awareness among employees can be assessed based on a variety of factors, including; number of personnel trained, survey of pollution prevention awareness, and data generated through questions incorporated into Environmental Audit checklists and flowcharts.

This information will be crucial for further defining and specifying the facility's goals, and for conducting the activities discussed in Step 5. Without comprehensive and accurate baseline information it will be impossible to set appropriate priorities, choose effective activities and strategies, or to assess the success of the program.

**Step Five: Conduct Pollution Prevention Activities and Opportunity Assessments**

Pollution prevention activities and opportunity assessments are ways for the CDC to use its baseline data, identify pollution prevention activities, and conduct opportunity assessments as part of the Pollution Prevention Plan. Activities may involve additional analysis to fully understand a particular process, or the identification of additional data needs. Some activities

may be implemented immediately, such as where existing pollution prevention strategies are readily amenable to a particular process.

Pollution prevention opportunity assessment is a tool used to systematically evaluate processes and operations to:

- characterize all aspects of the process or operation, including process flow, waste generation patterns, material and power consumption, costs, manpower, reliance on toxic chemicals,
- define the impacts that the process and related wastes have on the air, water, and land,
- associate impacts and wastes with specific unit operations,
- assign related costs and liabilities with specific wastes and management practices.

As discussed in Step 3, the EQC will conduct initial assessments in order to prioritize targets for further study. As priority targets are identified, stakeholders for the particular process or activity will be briefed, and their input sought. The support of such stakeholders is critical for the pollution prevention process to proceed from this point. Teams with appropriate expertise will then be created to review the data in more detail, and proceed to the subsequent steps of the process to generate options, conduct technical and economic feasibility analyses, and propose options for implementation.

Options for solutions vary widely and may include:

- policy changes
- procedural changes
- equipment modifications
- material substitution
- training
- efficiency improvements
- waste stream segregation
- housekeeping practices
- inventory control
- reuse of materials

**Current Activities**

*CHEMMAN*

The *CHEMMAN* team has conducted a survey of all CDC personnel handling chemicals to access what the needs and desires of those people are (Reference 1). Questions addressed; whether CDC personnel were satisfied with the current system, where chemicals were going

after use, how and where they were being stored, and present methods for tracking. The response rate was 33%.

Responses indicate that surplus chemicals are a problem at the CDC. Storing excess flammable, corrosive, toxic and reactive chemicals can cause safety concerns, in addition to being wasteful and inefficient. Surplus can occur because of time delays in obtaining certain chemicals, causing laboratories to order excess chemicals to avoid reordering during a project and inaccurate planning.

Possible solutions were evaluated including; more careful planning by researchers as to how much chemical they need during a time period, a more efficient procurement process to eliminate the need to over order, source reductions through curbing the amount of chemicals used, and identification and publication of effective chemical substitutes.

Ultimately, the team became aware of an existing program developed by the Department of Defense (DOD). The DOD had contracted with a vendor to provide needed chemicals on a Just in Time basis, that allowed for comprehensive tracking and coordinated ordering of appropriate amounts of materials. Implementation of this system is being pursued for CDC use.

LINDEN™

The LINDEN™ system mentioned in Step four may be used to track the acquisition, storing, distributing, using, and disposing of chemical materials. Its continued use has been proposed as a way to meet *CHEMMAN* and other pollution prevention goals. The system information and data inputs should provide several opportunities for pollution prevention assessments.

**Step Six: Develop Criteria and Rank Activities/Opportunities**

Once options are identified, they must be prioritized and ranked. This involves taking the activities that have been developed to reduce pollution and ranking them in the order they should be undertaken. The goals of the facility should play a part in this ranking. The EQC has adopted five recommended ranking criteria as follows:

- How will the activity impact on the mission of the CDC? (1= strong negative impact, 2= negative impact, 3= neutral impact, 4= positive impact, 5= strong positive impact.)

- Does the activity contribute to CDC's environmental compliance (1= large decrease in compliance, 2= decrease in compliance, 3= neutral impact, 4= enhances compliance, 5= greatly enhances compliance.)

- Does the activity contribute to the achievement of CDC's pollution prevention goals (1= strong negative contribution, 2= negative contribution, 3= neutral contribution, 4= positive contribution, 5= strong positive contribution.)

- Is the activity feasible in up front and long term costs, and ease of implementation? (1= very high cost and/or difficulty, 2= high cost and/or difficulty, 3= neutral, 4= low cost and/or difficulty, 5= very low cost and/or difficulty.)

- Does the activity enhance worker safety through minimizing exposure hazards? (1= greatly decreases worker safety, 2= decreases worker safety, 3= neutral impact, 4= enhances worker safety, 5= greatly enhances worker safety.)

These criteria are provided as a guide, based on our current understanding of CDC priorities and considerations. They may not always be appropriate to rank available options. Teams may substitute or otherwise change these criteria as needed. The EQC will continually evaluate the effectiveness of these criteria.

**Step Seven: Conduct a Management Review**

This step is another way to confirm management support. As the process progresses, the EQC will continually apprise appropriate levels of management. Periodically it may be necessary to present ranked pollution prevention options to middle and upper management. This will allow management to make decisions from a program-wide perspective about prioritizing pollution prevention projects, developing schedules and securing funds.

## Definitions:

1. Extremely Hazardous Substance - An "extremely hazardous substance" is defined in EPCRA section 329(3) (42 U.S.C. 11049(3)) and EPA regulations in 40 CFR 355.20 to mean a substance that is listed in Appendices A (in alphabetical order and B (by CAS number) of 40 CFR Part 355.

2. Pollution Prevention (P2) - Pollution prevention is defined in section 2-203 of Executive Order 12856 to mean "source reduction" as defined in the Pollution Prevention Act 1990 and other practices that reduce or eliminate the creation of pollutants through:

- increased efficiency in the use of raw materials, energy, water, or other resources; or

- protection of natural resources by conservation

3. Source Reduction - "Source reduction" is defined in the Pollution Prevention Act Section 6603(5) (42 U.S.C. 13102(5)) to mean any practice that:

- reduces the amount of any hazardous substance, pollutant or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal; and

- reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.

4. Release - "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment" A release, also, includes the following:

- fugitive and stack air emissions, releases to land, releases to water, and on-site or off-site disposal

- does not include any quantity treated on-site or off-site

- does not include releases (including on-site and off-site disposal) resulting from remedial actions, catastrophic events, or one-time events not associated with production process

**REFERENCES**

*CHEMMAN* Chemical User's Survey and Results, 1995. (Available thru OHS)

Environmental Protection Agency. *Federal Facility Pollution Prevention Planning Guide*, 1994 (EPA-300-B-94-013).

American Chemical Society. *Less Is Better*, 1993.